What is claimed is:

1. A power calibration apparatus for an optical disc comprising:

writing means for writing information for a test writing by emitting a laser light to a power calibration area on an optical disc;

reading means for reading the information for the test writing written in the optical disc;

a first calibration means for controlling writing by the writing means through changing in steps a writing power of the laser light for writing the information for the test writing, setting a stepwise changing amount to a non-dense degree, and identifying a calibration area which, among calibration areas divided by a non-dense unit on the optical disc, is divided by a dense unit instead of the non-dense unit;

a first writing power calculation means for reading the information for the test writing written in the optical disc under the control of the first calibration means, and calculating a first writing power in accordance with read out information for the test writing;

a second calibration means for setting, to the writing power of the laser light for writing the information for the test writing, the first writing power

as an initial value, and by changing the first writing power by a dense degree through steps corresponding in number to that of the calibration areas divided by the dense unit, urging the writing means to write corresponding to the steps in number; and

a second writing power calculation means for reading the information for the test writing written in the optical disc under the control of the second calibration means, and calculating a second writing power in accordance with the information for the test writing of a sample number corresponding to the number of the calibration areas.

2. The power calibration apparatus for an optical disc as claimed in claim 1, wherein the non-dense unit is an Atip unit and the dense unit is an EFM frame unit.

3. The power calibration apparatus for an optical disc as claimed in claim 1, wherein the first writing power calculation means and the second writing power calculation means satisfy an equation of $ß = (R1 + R2) / (R1 - R2)$, in which a maximum value and a minimum value of signals reproducing the information for the test writing are assumed to be R1 and R2, respectively, and the writing power is calculated in accordance with a ß value.

4. The power calibration apparatus for an optical disc as claimed in claim 1, wherein the second writing power calculation means outputs the second writing power by performing a true/false verification through a ß verification process.

5. The power calibration apparatus for an optical disc as claimed in claim 4, wherein the second writing power calculation means verifies true/false of the second writing power by comparing a ß value of a writing power set as a target with a ß value of an actually measured writing power, and the ß value is obtained from a formula of (R1 + R2) / (R1 — R2), in which a maximum value and a minimum value of a signal reproducing the information for the test writing are assumed to be R1 and R2, respectively.

6. The power calibration apparatus for an optical disc as claimed in claim 1, wherein the second calibration means urges the writing means to write repeatedly for a plurality of times, and in accordance with an average value obtained therein, the second power calculation means calculates the second writing power.

7. The power calibration apparatus for an optical

disc as claimed in claim 1, wherein the first writing power calculation means outputs the first writing power by performing a true/false verification through a ß verification process.

8. The power calibration apparatus for an optical disc as claimed in claim 7, wherein the first writing power calculation means verifies true/false of the first writing power by comparing a ß value of a writing power set as a target with a ß value of an actually measured writing power, and the ß value is obtained from a formula of $(R1 + R2) / (R1 - R2)$, in which a maximum value and a minimum value of a signal reproducing the information for the test writing are assumed to be R1 and R2, respectively.

9. A power calibration method for an optical disc comprising:

a step of first calibration which changes a writing power of a laser light for writing information for a test writing in steps, sets a stepwise changing amount to a non-dense degree, identifies a calibration area which, among calibration areas divided by a non-dense unit on the optical disc, is divided by a dense unit instead of the non-dense unit, and controls writing with the writing power;

a step of calculating a first writing power, which reads the information for the test writing written in the optical disc and calculates the first writing power in accordance with read out information for the test writing;

a step of second calibration which sets, to the writing power of the laser light for writing the information for the test writing into the optical disc, the first writing power as an initial value, and by changing the first writing power by a dense degree through steps corresponding in number to that of the calibration areas divided by the dense unit, urges to write with the first writing power corresponding to the steps in number;

a step of calculating a second writing power, which reads the information for the test writing written in the optical disc with the first writing power, and calculates the second writing power in accordance with the information for the test writing of a sample number corresponding to the number of the calibration areas; and

a step of verifying true/false of the second writing power through performing the test writing into the optical disc with the second writing power and reading the test writing written with the second writing power.

10. The power calibration method for an optical disc as claimed in claim 9, wherein the non-dense unit is an

Atip unit and the dense unit is an EFM frame unit.

11. The power calibration method for an optical disc as claimed in claim 9, wherein in the first writing power calculation step and the second writing power calculation step, an equation of ß = (R1 + R2) / (R1 − R2) is satisfied, in which a maximum value and a minimum value of signals reproducing the information for the test writing are assumed to be R1 and R2, respectively, and the writing power is calculated in accordance with a ß value.

12. The power calibration method for an optical disc as claimed in claim 9, wherein in the second writing power calculation step, the second writing power is output by performing a true/false verification through a ß verification process.

13. The power calibration method for an optical disc as claimed in claim 12, wherein in the second writing power calculation step, true/false of the second writing power is verified by comparing a ß value of a writing power set as a target with a ß value of the second writing power output in the second writing power calculation step, and the ß value is obtained from a formula of (R1 + R2) / (R1 − R2), in which a maximum value and a minimum value of a signal

reproducing the information for the test writing are assumed to be R1 and R2, respectively.

14. A power calibration method for an optical disc comprising:

a step of first calibration which changes a writing power of a laser light for writing information for a test writing in steps, sets a stepwise changing amount to a non-dense degree, identifies a calibration area which, among calibration areas divided by a non-dense unit on the optical disc, is divided by a dense unit instead of the non-dense unit, and controls writing with the writing power;

a step of calculating a first writing power, which reads the information for the test writing written in the optical disc and calculates the first writing power in accordance with read out information for the test writing;

a step of verifying true/false of the first writing power through performing the test writing into the optical disc with the first writing power and reading the test writing written in the optical disc;

a step of second calibration which sets, to the writing power of the laser light for writing the information for the test writing into the optical disc, the first writing power verified as true in the step of

verifying as an initial value, and by changing the first writing power by a dense degree through steps corresponding in number to that of the calibration areas divided by the dense unit, urges to write with the first writing power corresponding to the steps in number;

a step of calculating a second writing power, which reads the information for the test writing written in the optical disc with the first writing power, and calculates the second writing power in accordance with the information for the test writing of a sample number corresponding to the number of the calibration areas; and

a step of verifying true/false of the second writing power through performing the test writing into the optical disc with the second writing power and reading the test writing.

15. The power calibration method for an optical disc as claimed in claim 14, wherein the non-dense unit is an Atip unit and the dense unit is an EFM frame unit.

16. The power calibration method for an optical disc as claimed in claim 14, wherein in the first writing power calculation step and the second writing power calculation step, an equation of $ß = (R1 + R2) / (R1 - R2)$ is satisfied, in which a maximum value and a minimum value of

signals reproducing the information for the test writing are assumed to be R1 and R2, respectively, and the writing power is calculated in accordance with a ß value.

17. The power calibration method for an optical disc as claimed in claim 14, wherein in the second writing power calculation step, the second writing power is output by performing a true/false verification through a ß verification process.

18. The power calibration method for an optical disc as claimed in claim 17, wherein in the second writing power calculation step, true/false of the second writing power is verified by comparing a ß value of a writing power set as a target with a ß value of the second writing power output in the second writing power calculation step, and the ß value is obtained from a formula of (R1 + R2) / (R1 − R2), in which a maximum value and a minimum value of a signal reproducing the information for the test writing are assumed to be R1 and R2, respectively.

19. The power calibration method for an optical disc as claimed in claim 14, wherein writing is performed repeatedly for a plurality of times in the second calibration step, and in accordance with an average value

obtained therein, the second writing power is calculated in the second writing power calculation step.

20. The power calibration method for an optical disc as claimed in claim 14, wherein in the first writing power calculation step, the first writing power is output by performing a true/false verification through a ß verification process.

21. The power calibration method for an optical disc as claimed in claim 14, wherein in the first writing power calculation step, true/false of the first writing power is verified by comparing a ß value of a writing power set as a target with a ß value of the first writing power output in the first writing power calculation step, and the ß value is obtained from a formula of

$(R1 + R2) / (R1 - R2)$, in which a maximum value and a minimum value of a signal reproducing the information for the test writing are assumed to be R1 and R2, respectively.